

CONTAINS:
NOVEMBER 1991
UNITED
STATES
CLIMATE
SUMMARY

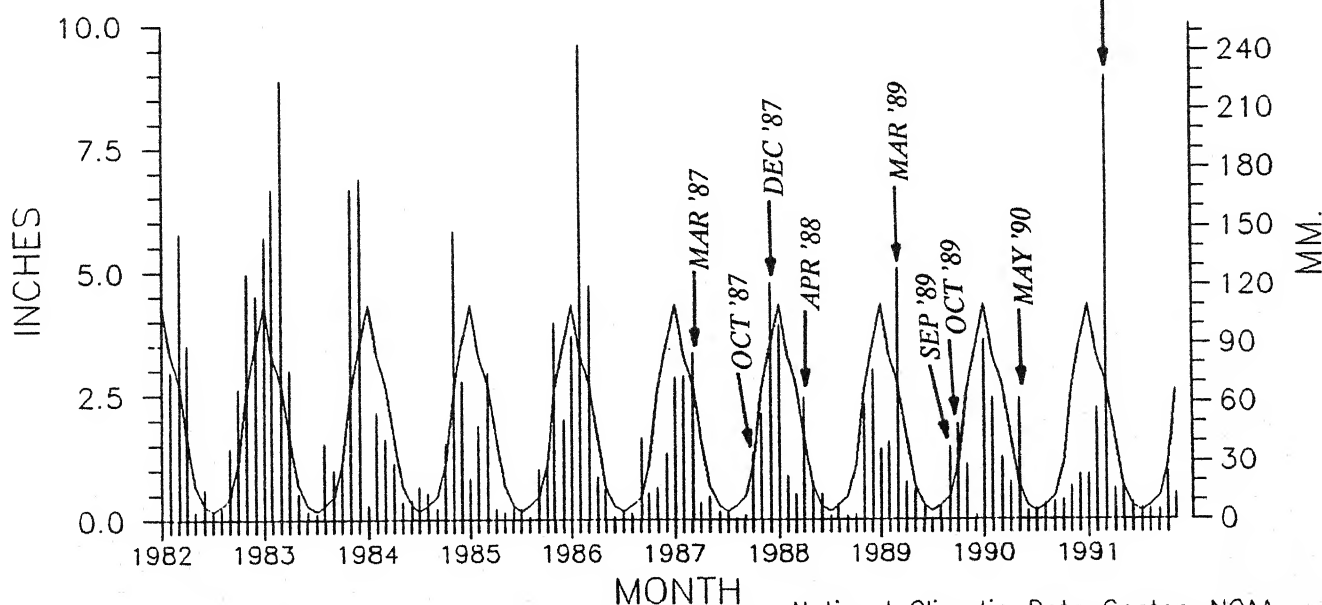
WEEKLY CLIMATE BULLETIN

No. 91/49

Washington, DC

December 7, 1991

CALIFORNIA STATEWIDE PRECIPITATION
 JANUARY 1982–NOVEMBER 1991



National Climatic Data Center, NOAA

VERTICAL BARS ARE OBSERVED PRECIPITATION
 CURVED LINE IS NORMAL PRECIPITATION

Although a series of storms battered the Pacific Northwest and Intermountain West, the systems generally remained north of California, allowing little or no precipitation to fall on much of the state. This makes 1991 – 1992 the sixth consecutive rainy season to start off slowly. Since October 1986, only 9 of the 47 wet-season months (September – May) have featured above normal statewide precipitation.



UNITED STATES DEPARTMENT OF COMMERCE
 NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
 NATIONAL WEATHER SERVICE–NATIONAL METEOROLOGICAL CENTER
CLIMATE ANALYSIS CENTER



WEEKLY CLIMATE BULLETIN

This Bulletin is issued weekly by the Climate Analysis Center and is designed to indicate, in a brief concise format, current surface climatic conditions in the United States and around the world. The Bulletin contains:

- *Highlights of major climatic events and anomalies.*
- *U.S. climatic conditions for the previous week.*
- *U.S. apparent temperatures (summer) or wind chill (winter).*
- *Global two-week temperature anomalies.*
- *Global four-week precipitation anomalies.*
- *Global monthly temperature and precipitation anomalies.*
- *Global three-month precipitation anomalies (once a month).*
- *Global twelve-month precipitation anomalies (every three months).*
- *Global three-month temperature anomalies for winter and summer seasons.*
- *Special climate summaries, explanations, etc. (as appropriate).*

Most analyses contained in this Bulletin are based on preliminary, unchecked data received at the Climate Analysis Center via the Global Telecommunications System. Similar analyses based on final, checked data are likely to differ to some extent from those presented here.

STAFF

Editor	Tom Heddinghaus
Associate Editor	Richard Tinker
Contributors	Joe Harrison Paul Sabol David C. Stutzer
Graphics	Robert H. Churchill Alan Herman

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GLOBAL CLIMATE HIGHLIGHTS

MAJOR CLIMATIC EVENTS AND ANOMALIES AS OF DECEMBER 7, 1991

1. Western United States:

ANOTHER SLOW START TO THE RAINY SEASON.

The northern half and western coastline of California, where only 8% to 40% of normal precipitation has fallen since late October, have now experienced the sixth consecutive slow start to the rainy season, dating back to October 1986. Last week, only 15-30 mm fell on scattered locations across northern California, with less than 10 mm reported elsewhere [5 weeks].

2. Central United States:

HEAVY PRECIPITATION AGAIN SOAKS MUCH OF REGION.

Heavy precipitation soaked a broad region from the lower Mississippi Valley northeastward through the central Appalachians and mid-Atlantic, where 50-260 mm were measured. Excessively wet weather has affected a swath from northern Arkansas to southern Tennessee during the last three weeks, with up to 525 mm soaking parts of northeastern Mississippi since November 17. Heavy rains sent several rivers out of their banks in the southern Ohio, Tennessee, and lower Mississippi Valleys as well as through the southern Appalachians, according to press reports. In contrast, the rains provided beneficial moisture to portions of the central Appalachians, northern mid-Atlantic, and upper Ohio Valley, where long-term dryness has been problematic since Spring, while drier weather helped reduce moisture surpluses from the east-central Great Plains through the middle Mississippi Valley and Great Lakes [7 weeks].

3. Southeastern United States:

ABNORMALLY DRY CONDITIONS PERSIST EAST OF THE APPALACHIANS.

While moderate to heavy rains (50-160 mm) brought relief from the recent dryness to the Appalachians and mid-Atlantic, most of the Southeast from south-central and Tidewater Virginia southward recorded little rainfall, keeping moisture deficits intact. Fewer than 35 mm were measured throughout the region, with little or none reported from the Carolinas' Atlantic Coastal Plains southward. Since late October, many locations have received 50-105 mm less than normal precipitation [10 weeks].

4. East-Central Europe:

DRIER CONDITIONS EASE WET SPELL.

Most locations recorded under 10 mm of rain, although scattered 20-40 mm totals were measured in central and eastern Austria and along the northern tier of Czechoslovakia [Ended after 6 weeks].

5. Northeastern Africa and the Middle East:

HEAVY PRECIPITATION AND HIGH WINDS POUND REGION.

Much of the eastern Mediterranean rim, from northeastern Libya through Israel to portions of southern Turkey and Cyprus, were barraged by some of

the strongest storms to affect the region in several years (see page 6). According to press reports, parts of Jordan experienced the heaviest rainfall in 12 years while 72-hour amounts in Cyprus were the largest since 1936. Much of central Israel, northwestern Jordan, Lebanon, northwestern Syria, and Cyprus measured 50-150 mm, with unofficial reports of up to 325 mm in Israel. Slightly lower totals from northeastern Libya eastward through northern Egypt flooded parts of the Nile River Delta [Episodic Event].

6. Southern India:

ANOTHER DRY WEEK ENDS RECENT WETNESS.

Little or no rain fell across the region, reducing moisture surpluses below critical levels [Ended after 6 weeks].

7. Eastern Asia:

VERY DRY CONDITIONS PERSIST.

Less than 10 mm of precipitation were reported throughout the region. Although normal amounts are relatively low during the last three months of the year, southern sections have received 50-65 mm below normal precipitation since late October, and most locations have measured only 5% to 45% of typical amounts during the period [11 weeks].

8. The Philippines:

ABNORMALLY WET WEATHER CEASES.

Most of the central and east-central Philippines were dampened by 20-60 mm of rain while little or none fell elsewhere, bringing an end to the wet spell [Ended after 5 weeks].

9. Indonesia:

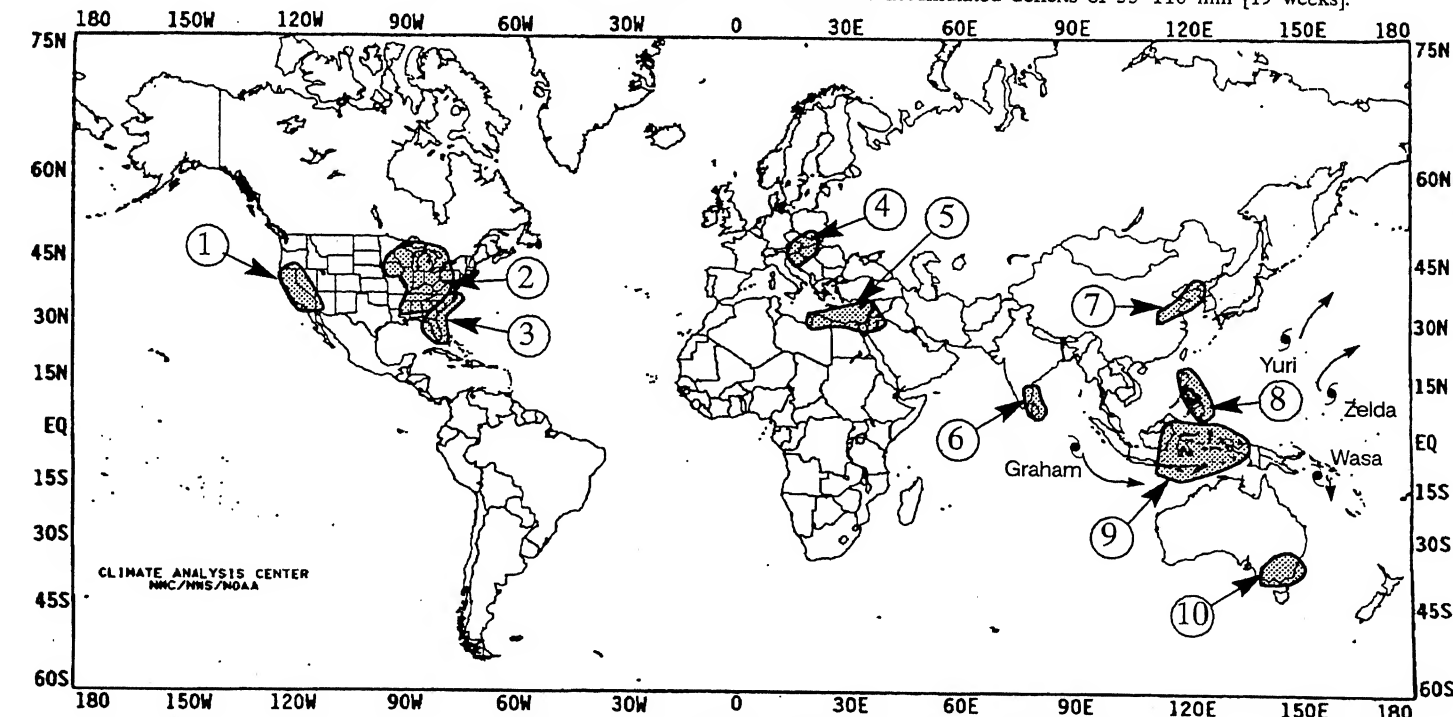
MODERATE TO HEAVY RAINFALL ALLEVIATES DROUGHT CONDITIONS.

Well above normal rainfall across most of the country {50-250 mm in Java, Sumatra, and Indonesian Borneo, 30-100 mm across Celebes, Irian Jaya, and the Moluccas, and less than 10 mm through the typically dry eastern Sundas} brought an end to the dry spell that has been gradually diminishing for a few weeks [Ended after 14 weeks].

10. Eastern Australia:

ANOTHER SHOWERY WEEK HELPS NORTHERN SECTIONS; STILL MUCH TOO DRY FARTHER SOUTH.

Much of northeastern and east-central Australia experienced another week of sporadic shower activity, which brought 40-90 mm of rain to northern and east-central Queensland while 15-30 mm dampened southeastern Queensland and adjacent New South Wales. From west-central Queensland southeastward through most of New South Wales and Victoria, however, little or no rainfall was again measured. Since late October, these latter areas have accumulated deficits of 55-110 mm [19 weeks].



EXPLANATION

TEXT: Approximate duration of anomalies is in brackets. Precipitation amounts and temperature departures are this week's values.

MAP: Approximate locations of major anomalies and episodic events are shown. See other maps in this Bulletin for current two week temperature anomalies, four week precipitation anomalies, long-term anomalies, and other details.

UNITED STATES WEEKLY CLIMATE HIGHLIGHTS

FOR THE WEEK OF DECEMBER 1 - 7, 1991

A stalled frontal system during the first part of the week dumped heavy rain on a broad area from the eastern Southern Plains and lower Mississippi Valley to southern New England and the mid-Atlantic coast. Amounts reaching 10.2 inches were measured in parts of southern Tennessee. The rain was quite beneficial in the parched mid-Atlantic, but aggravated long-term wetness in the southern Ohio, Tennessee, and lower Mississippi Valleys, where the heavy rainfall sent some rivers out of their banks, flooding roads and nearby lowlands (see Figure 1). Unseasonably warm weather prevailed ahead of the system as several record daily highs were set from Baton Rouge, LA to Montpelier, VT and Ft. Myers, FL. In sharp contrast, record breaking cold behind the system gripped the Midwest, where temperatures dropped below zero. Snow fell across a large region from the northern Plains to the Northeast, with parts of the lee of the Great Lakes buried under nearly two feet of snow, forcing school closures. Around mid-week, unseasonably warm weather in the East gave way to more seasonable conditions as the colder air pushed to the Atlantic and Gulf coasts. Cold air also settled into the Southwest, where weekly temperatures averaged more than 6°F below normal. At week's end, a powerful Pacific storm spread heavy precipitation (snow in the higher elevations) across the Northwest. Dry weather, however, remained in California, as well as the southern Atlantic seaboard, aggravating long-term dry spells in both areas. Elsewhere, up to eight inches of rain drenched eastern Hawaii early in the week while a strong storm dumped twelve to eighteen inches of snow on the Anchorage, AK area at week's end.

As the week commenced, a frontal system became stationary from the lower Mississippi Valley through the Tennessee Valley to the mid-Atlantic coast. Showers and thunderstorms along and ahead of the system soaked the region for several days. Amounts of two to ten inches were measured in the Tennessee and lower Mississippi Valleys, with one to three inches dampening the mid-Atlantic. A former Governor of Kentucky drowned attempting to cross the swollen Red River in eastern Kentucky. Elsewhere, the second winter storm in as many days struck the Midwest, knocking out electricity in Indiana when power lines became coated with ice. At least eleven deaths were caused across the Midwest by the wintry weather, according to press reports. High winds and heavy

snow combined to generate blinding whiteout conditions across the northern Plains and upper Great Lakes, closing schools and shutting down some roads. In addition, very low temperatures and high winds sent wind chills down to -60°F in North Dakota.

During the latter part of the week, another storm system brought severe weather to the Midwest, with tornadoes causing extensive damage in McLean County, IL. Meanwhile, snow blanketed an area from the Dakotas to New England. A Pacific storm caused heavy rain (snow in the higher elevations) across the Pacific Northwest and Intermountain West. Fair weather prevailed over much of the remainder of the country as abnormally mild weather returned to the Southeast and mid-Atlantic at week's end.

According to the River Forecast Centers, the heaviest precipitation (more than 2 inches) fell across a broad area from the lower Mississippi Valley to the Northeast, in western Washington and Oregon, along the Alaskan panhandle, through eastern Hawaii, and in portions of the southeastern Plains [Table 1]. More than seven inches drenched portions of the Tennessee Valley. Light to moderate totals were measured across the remainders of the eastern half of the nation, the Pacific Northwest, southern Alaska, and Hawaii. Little or no precipitation was reported in central and southern California, the desert Southwest, the Great Basin, and much of the Rockies and Great Plains.

Above normal temperatures prevailed across the Pacific Northwest, the mid-Atlantic, the Southeast, Alaska, and Hawaii [Table 2]. Weekly departures of +3°F to +7°F were common along the middle and southern Atlantic seaboard and in the Northwest. Temperatures ranged from 4°F to 11°F above normal in the interior portions of Alaska while departures of +2°F to +4°F covered most of Hawaii.

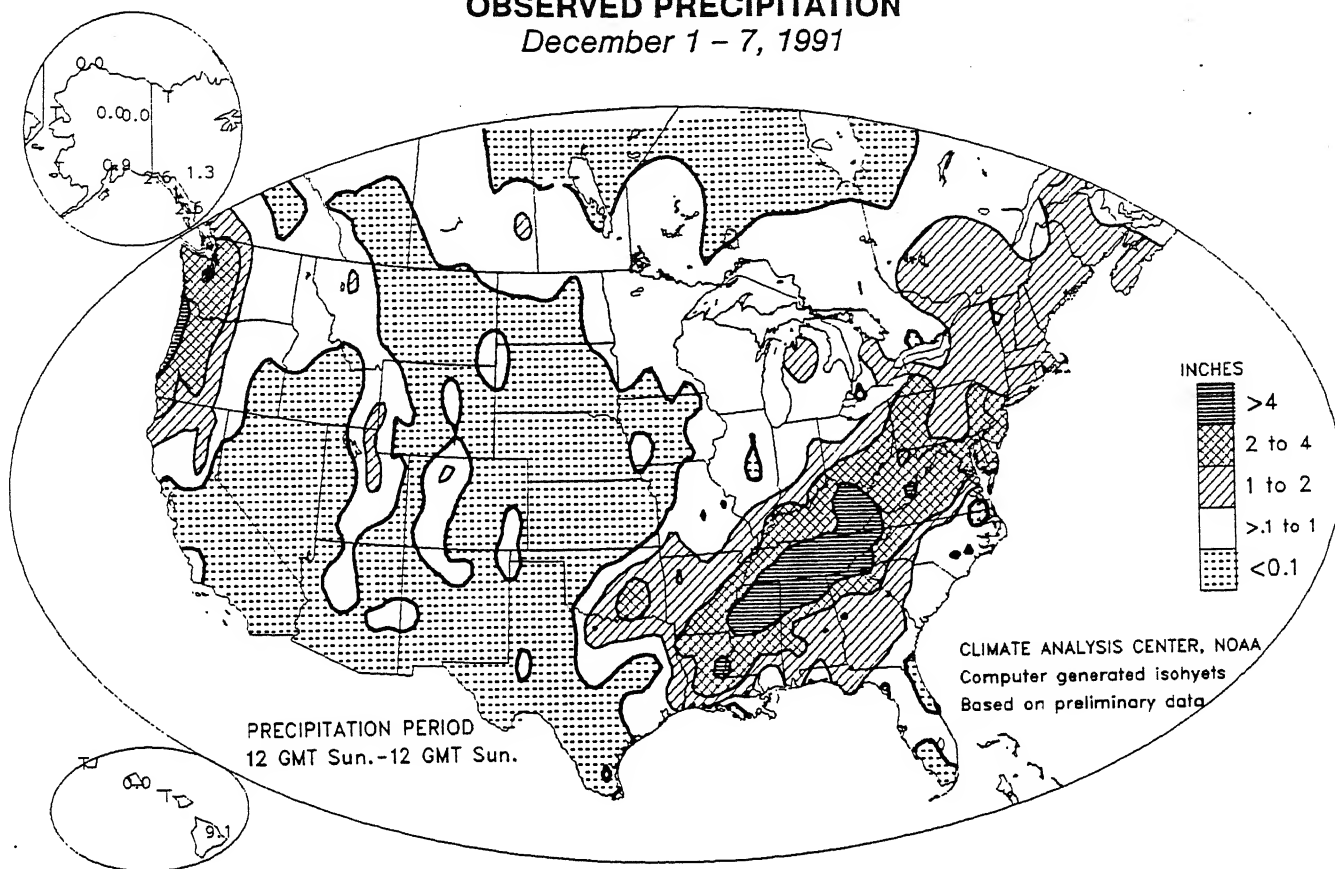
Abnormally cold air spread through much of the northern Plains, upper and middle Mississippi Valley, Great Lakes, Northeast, Southwest and southern Plains [Table 3]. The largest departures were found across the northern Plains, upper Mississippi Valley, upper Great Lakes, and the southern Intermountain West, where temperatures averaged 6°F to 15°F below normal. Strong winds accompanied the bitterly cold arctic air across the northern Plains and upper Mississippi Valley, sending wind chills plunging below -45°F.

TABLE 1. SELECTED STATIONS WITH 3.50 OR MORE INCHES OF PRECIPITATION DURING THE WEEK OF DECEMBER 1 - 7, 1991

<u>STATION</u>	<u>TOTAL (INCHES)</u>	<u>STATION</u>	<u>TOTAL (INCHES)</u>
HILO/LYMAN, HAWAII, HI	9.15	JACKSON, KY	4.61
DUPELO, MS	7.86	NASHVILLE, TN	4.34
MUSCLE SHOALS, AL	7.36	SITKA, AK	4.33
HUNTSVILLE, AL	7.05	MERIDIAN, MS	4.19
STAMPEDE PASS, WA	6.90	EL DORADO, AR	4.17
CROSSVILLE, TN	6.21	LEXINGTON, KY	4.10
KNOXVILLE, TN	6.03	ASTORIA, OR	3.73
ANNETTE ISLAND, AK	5.96	JACKSON, TN	3.71
GREENWOOD, MS	4.97	MEMPHIS, TN	3.68
QUILLAYUTE, WA	4.67	ASHEVILLE, NC	3.59
LONDON/CORBIN, KY	4.64	HICKORY, NC	3.53

OBSERVED PRECIPITATION

December 1 - 7, 1991



DEPARTURE OF AVERAGE TEMPERATURE FROM NORMAL (°F)

December 1 - 7, 1991

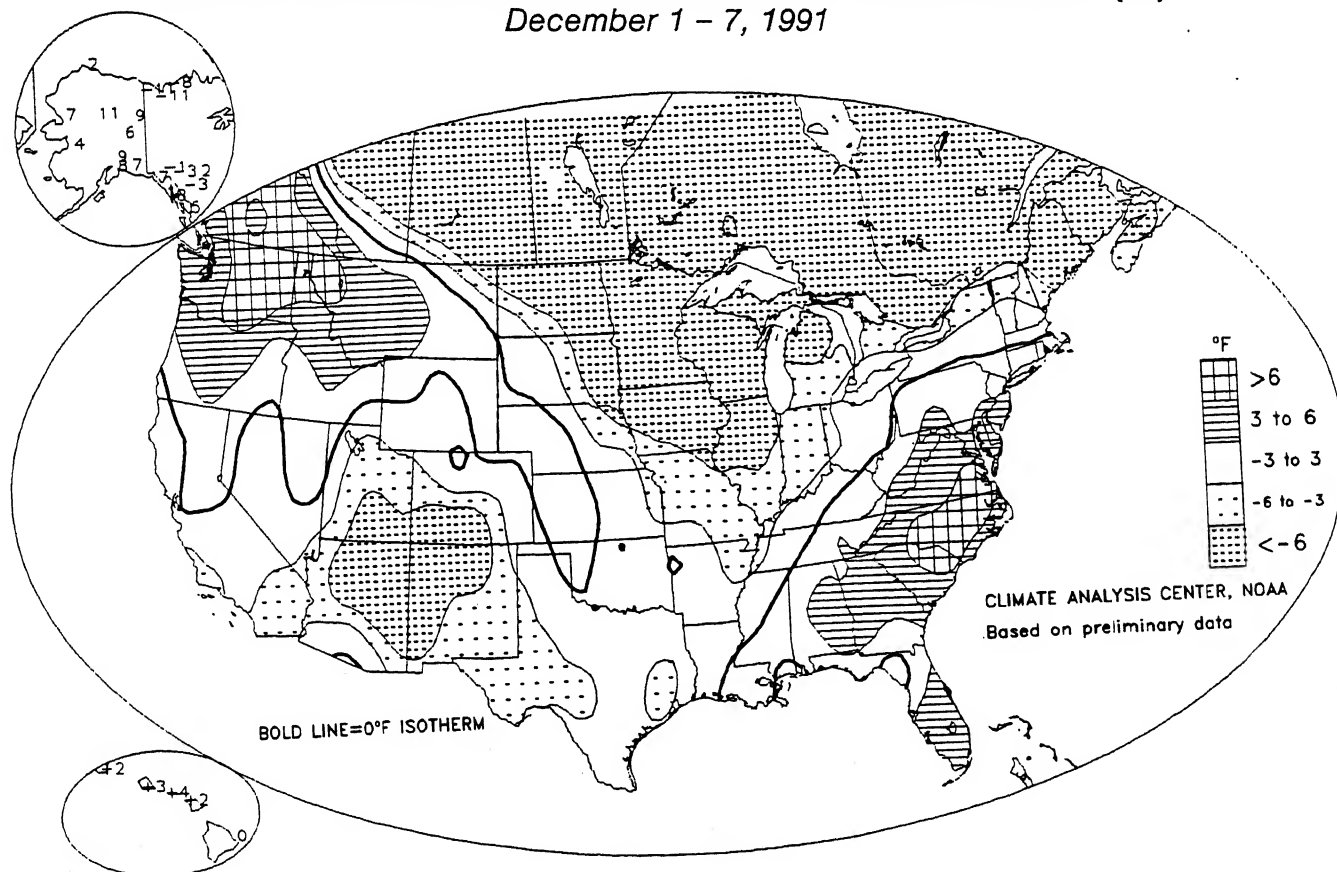


TABLE 2. SELECTED STATIONS WITH TEMPERATURES AVERAGING 7.0°F OR MORE ABOVE NORMAL FOR THE WEEK OF DECEMBER 1 - 7, 1991

<u>STATION</u>	<u>DEPARTURE</u> (°F)	<u>AVERAGE</u> (°F)	<u>STATION</u>	<u>DEPARTURE</u> (°F)	<u>AVERAGE</u> (°F)
BETTLES, AK	+11.9	6.0	SITKA, AK	+8.3	42.4
KENAI, AK	+9.9	24.7	PENDLETON, OR	+7.9	45.6
FT YUKON, AK	+9.4	-6.3	WALLA WALLA, WA	+7.8	46.4
CORDOVA/MILE 13, AK	+9.3	34.9	YAKIMA, WA	+7.8	41.6
TALKEETNA, AK	+9.0	20.1	VALDEZ, AK	+7.4	28.4
RALEIGH-DURHAM, NC	+8.6	52.9	KOTZEBUE, AK	+7.4	6.1
ANCHORAGE, AK	+8.5	24.8	FAYETTEVILLE, NC	+7.1	53.5
GOLDSBORO/JOHNSON AFB, NC	+8.4	54.4	YAKUTAT, AK	+7.1	36.1
CUT BANK, MT	+8.4	32.6	SPOKANE, WA	+7.0	38.0
			KALISPELL, MT	+7.0	34.1

TABLE 3. SELECTED STATIONS WITH TEMPERATURES AVERAGING 10.0°F OR MORE BELOW NORMAL FOR THE WEEK OF DECEMBER 1 - 7, 1991

<u>STATION</u>	<u>DEPARTURE</u> (°F)	<u>AVERAGE</u> (°F)	<u>STATION</u>	<u>DEPARTURE</u> (°F)	<u>AVERAGE</u> (°F)
WARROAD, MN	-18.1	-3.3	LA CROSSE, WI	-11.8	14.7
INTERNATIONAL FALLS, MN	-16.4	-2.4	ROCHESTER, MN	-11.7	11.5
ST CLOUD, MN	-15.2	5.7	FARGO, ND	-11.5	6.9
DULUTH, MN	-14.2	4.8	FARMINGTON, NM	-11.0	21.9
GRAND FORKS, ND	-14.0	2.5	WAUSAU, WI	-10.9	12.0
ALAMOSA, CO	-13.9	7.9	HANCOCK/HOUGHTON CO, MI	-10.9	12.5
MINNEAPOLIS, MN	-13.3	10.8	DUBUQUE, IA	-10.6	16.7
DEVIL'S LAKE, ND	-13.2	2.7	SPENCER, IA	-10.3	14.2
WINSLOW, AZ	-13.2	22.4	PRESCOTT, AZ	-10.2	28.8
MARQUETTE, MI	-12.3	9.6	HOULTON, ME	-10.1	11.8
PARK FALLS, WI	-12.1	8.5	WATERLOO, IA	-10.1	16.7
EAU CLAIRE, WI	-12.0	10.6	MASON CITY, IA	-10.0	14.6
ALEXANDRIA, MN	-11.8	7.6	CEDAR RAPIDS, IA	-10.0	19.6
MINOT, ND	-11.8	7.6			

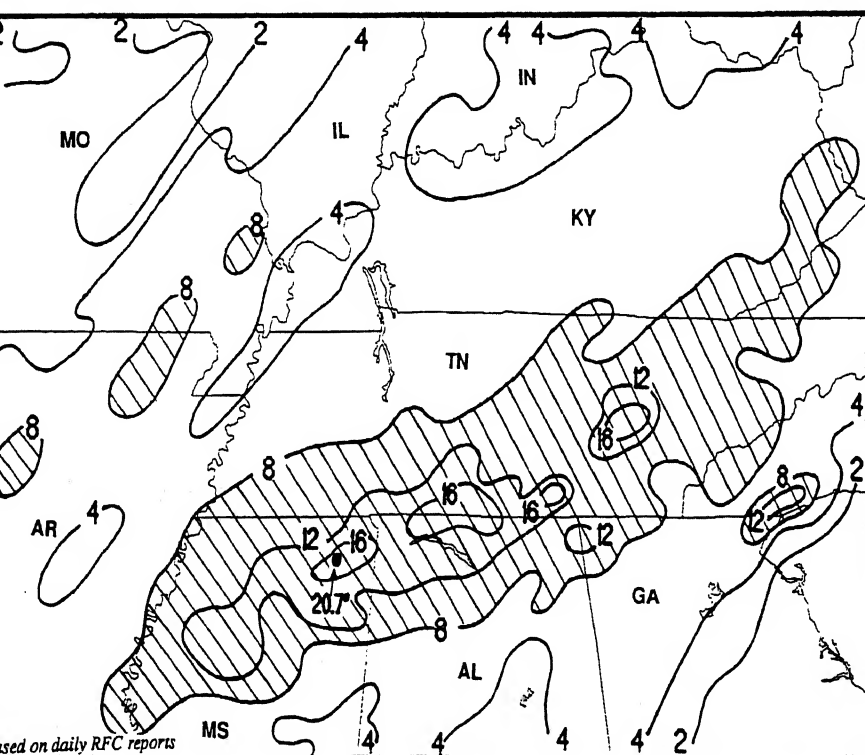
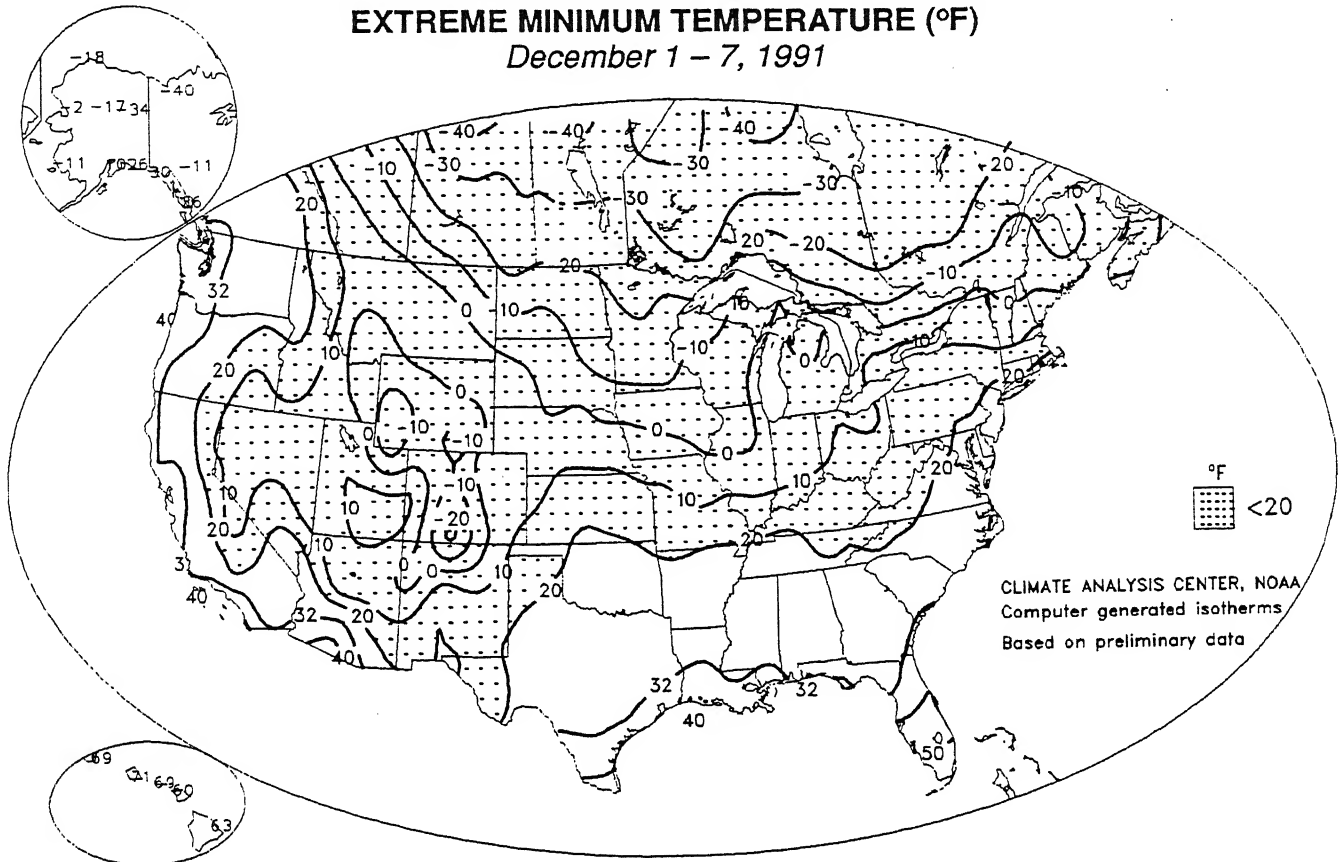


FIGURE 1. Total Precipitation during November 17 - December 7, 1991. Several slow-moving frontal systems during the past three weeks dumped heavy rain (over 8 inches) from the northern lower Mississippi Valley eastward to the southern and central Appalachians as well as across parts of northeastern Arkansas and southeastern Missouri. More than a foot and a half of rain inundated parts of northern Mississippi and southern Tennessee since mid-November. In addition, severe thunderstorms spawned a few tornadoes in parts of Missouri and Mississippi during the period. The heavy rains produced a large amount of run-off that sent a number of rivers out of their banks, flooding several roads and nearby lowlands, according to the Office of Hydrology.

EXTREME MINIMUM TEMPERATURE (°F)

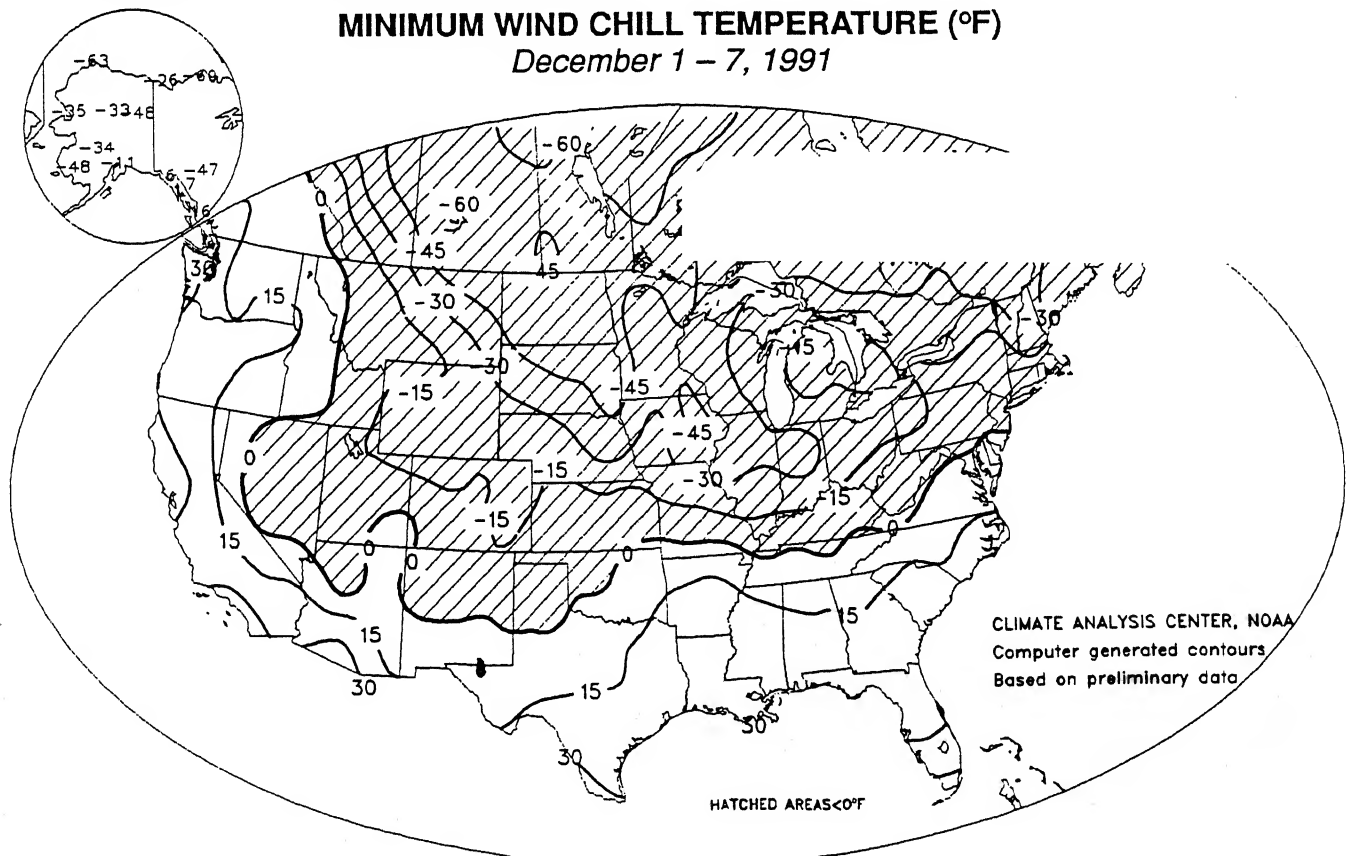
December 1 – 7, 1991



A blast of cold Arctic air early in the week brought sub-zero temperatures to the Rockies, northern Plains, upper Midwest, and northern New England. Only portions of the desert Southwest and the Pacific, Gulf and south Atlantic coasts remained above freezing all week (top). The cold air was accompanied by strong winds, producing dangerous wind chills ($< -30^{\circ}\text{F}$) in the northern and central Plains, Midwest, Great Lakes, and northern New England (bottom).

MINIMUM WIND CHILL TEMPERATURE (°F)

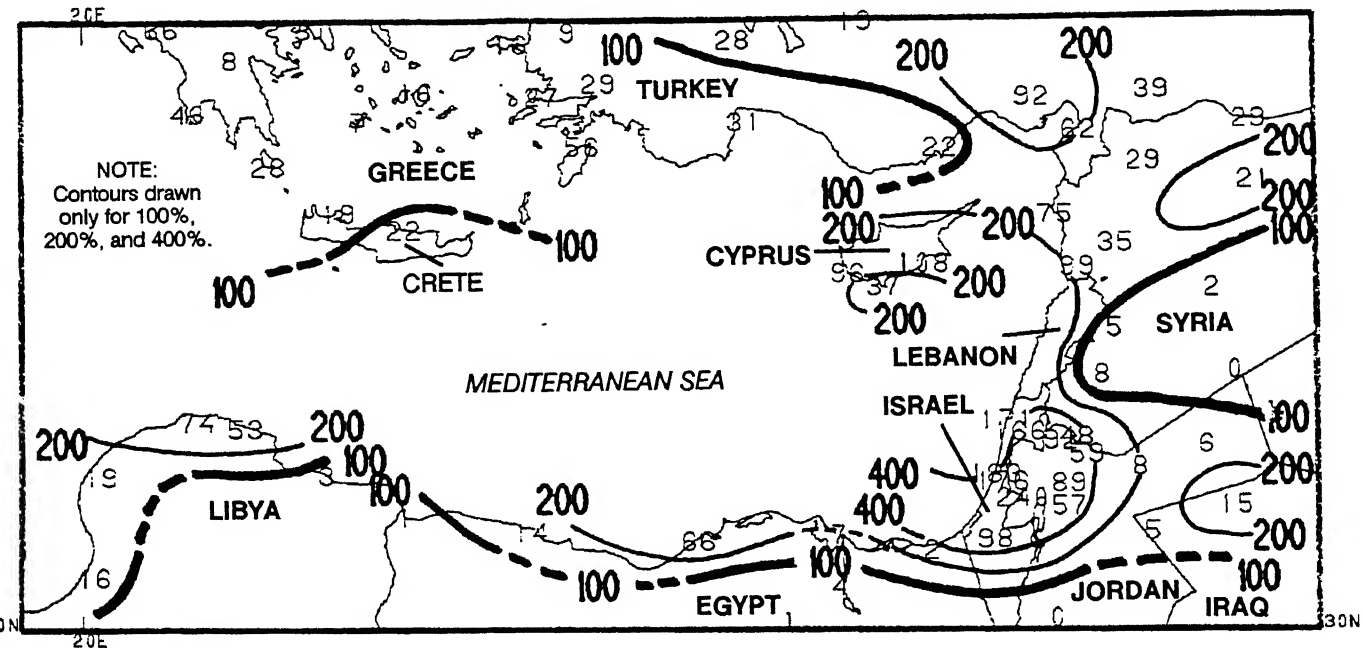
December 1 – 7, 1991



GLOBAL CLIMATE HIGHLIGHTS FEATURE

PLOTTED VALUES: TOTAL PRECIPITATION (MM)
CONTOURS: PERCENT OF NORMAL PRECIPITATION

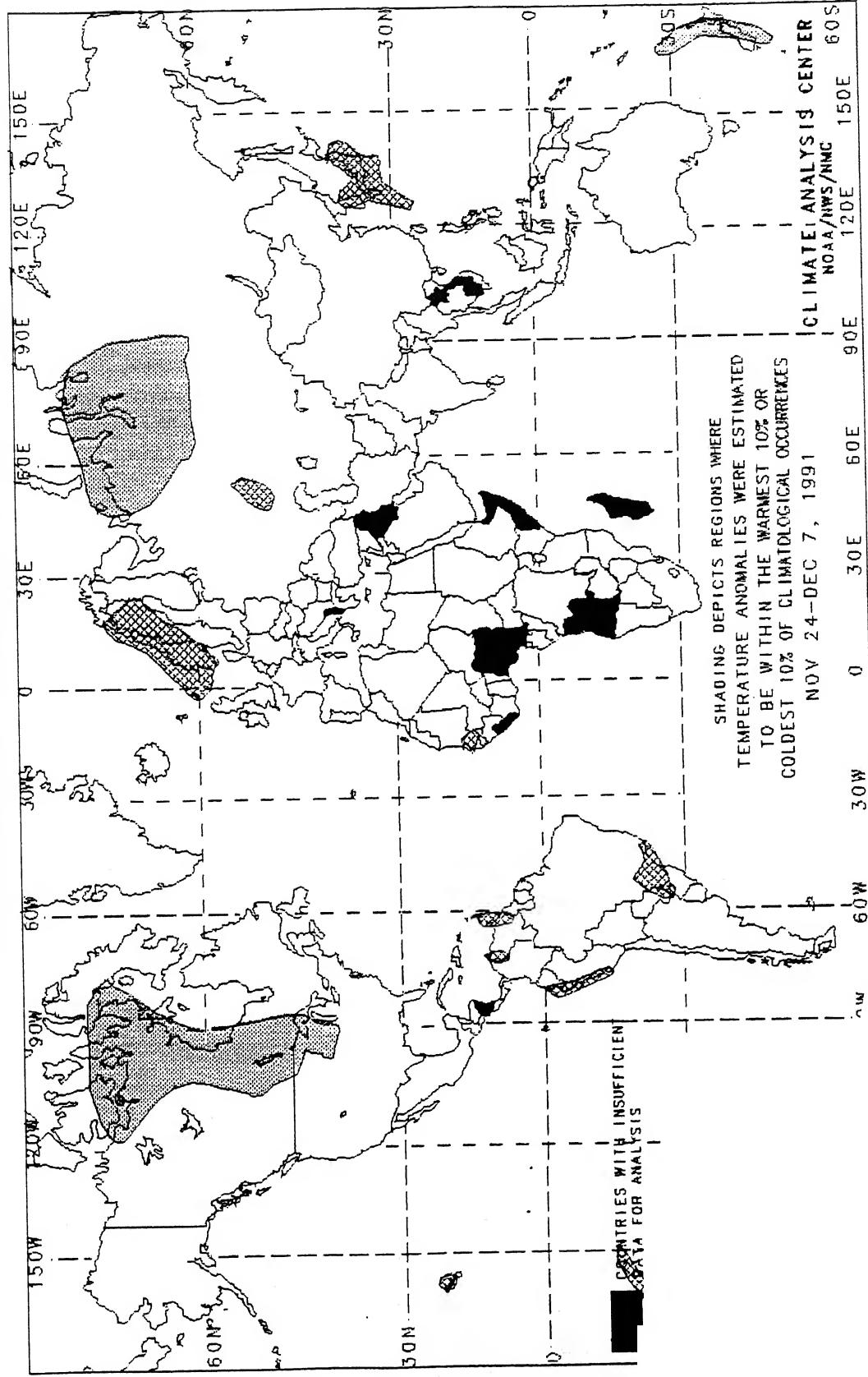
November 27 - December 7, 1991



Beginning in late November, some of the fiercest winter storms in 50 years battered parts of the Middle East, but also provided relief to a region that has been suffering through a prolonged dry spell for over two years. During the 11-day period November 27 - December 7, 1991, 100-250 mm of precipitation soaked portions of Cyprus and much of the Middle East from central Israel northward through northwestern Jordan while parts of northeastern Libya, northern coastal Egypt, western Syria, and southern Turkey received 50-100 mm. According to press reports, heavy rains generated flooding at coastal locations in the Nile River Delta and western sections of Israel and Lebanon. The heaviest rains in 12 years continued to pound Jordan as the week ended, and some sections of Cyprus recorded the highest 72-hour totals since 1936 over the weekend. Farther inland, heavy snows isolated more than 70 villages in western Turkey while mountain roads in Syria and Lebanon were forced to close by heavy snows and wind gusts reaching 100 kph. In addition, torrential rains also brought flooding to western Iran, washing away several dwellings and bridges and isolating dozens of villages, according to Tehran Radio. Farther west flash floods also afflicted portions of Morocco and the Western Sahara, forcing the main highway areas to close. By December 7, some Israeli and Jordanian regions had received nearly 90% of several lives had been lost because of the resultant flooding; however, the heavy rain was a relief for the region as a whole. A few reservoirs, previously at critically low levels, were refilled and several rivers in the Taurus Mountains of Cyprus flowed for the first time in years.

2-WEEK GLOBAL TEMPERATURE ANOMALIES

NOVEMBER 24 - DECEMBER 7, 1991



In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

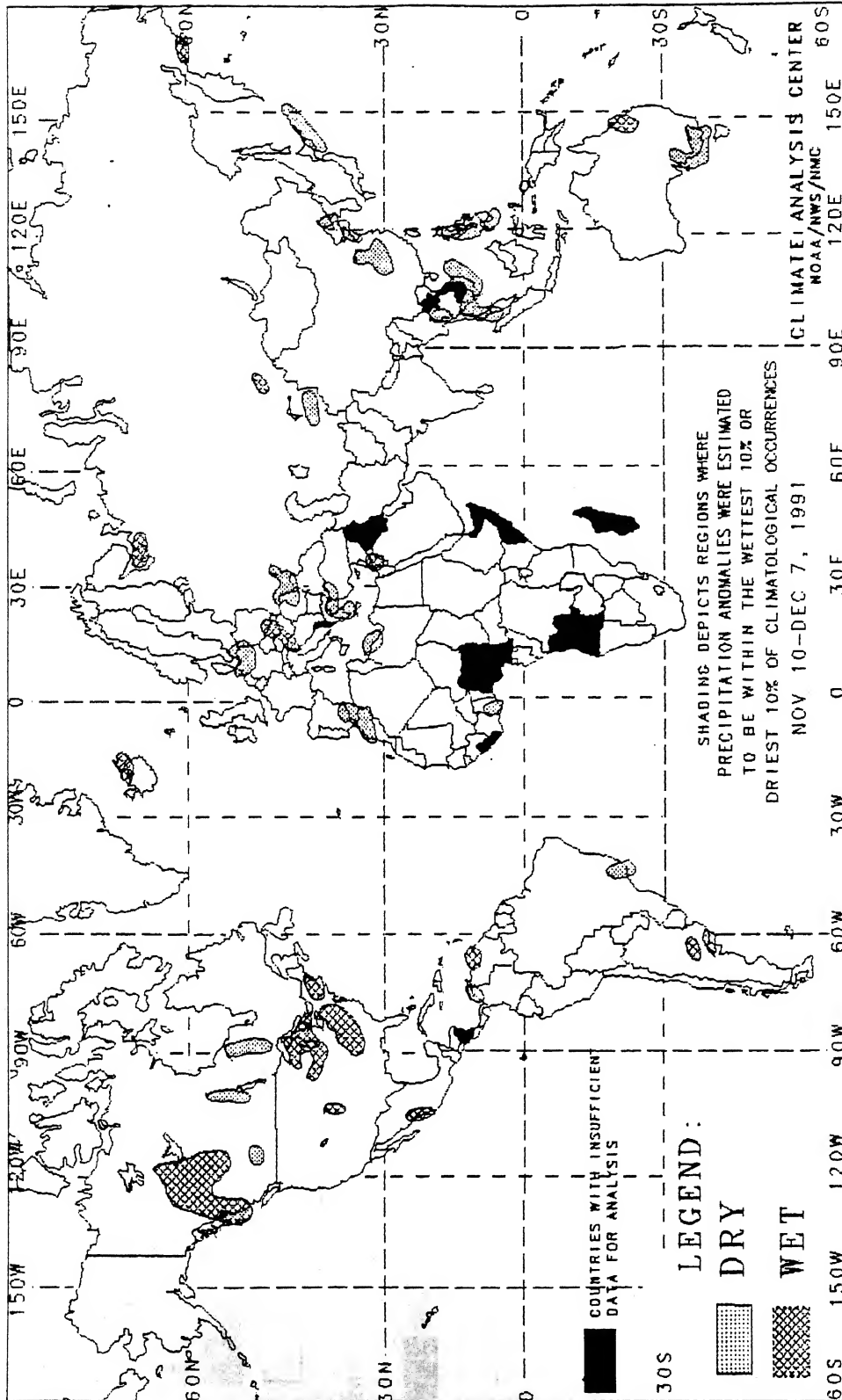
This chart shows general areas of two week temperature anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

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4-WEEK GLOBAL PRECIPITATION ANOMALIES

NOVEMBER 10 - DECEMBER 7, 1991



The anomalies on this chart are based on approximately 2500 observing stations for which at least 27 days of precipitation observations (including zero amounts) were received or estimated from synoptic reports. As a result of both missing observations and the use of estimates from synoptic reports (which are conservative), a dry bias in the total precipitation amount may exist for some stations used in this analysis. This in turn may have resulted in an overestimation of the extent of some dry anomalies.

In climatologically arid regions where normal precipitation for the four week period is less than 20 mm, dry anomalies are not depicted. Additionally, wet anomalies for such arid regions are not depicted unless the total four week precipitation exceeds 50 mm.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of four week precipitation anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

UNITED STATES MONTHLY CLIMATE SUMMARY

NOVEMBER 1991

November 1991 featured powerful storms that swept through the nation's midsection, bringing record snowfall, freezing rain, and frigid air to the upper Midwest and severe weather and heavy rain to portions of the middle and lower Mississippi and Tennessee Valleys, Appalachians, and central Gulf coast. Cities establishing new November snowfall records included Duluth, MN [50.1"], Marquette, MI [48.9"], Minneapolis, MN [46.9", an all-time monthly record], La Crosse, WI [30.3"], Colorado Springs, CO [21.7"], Waterloo, IA [15.4"], and Des Moines, IA [14.0"]. A few storms systems also moved through the Pacific Northwest and Intermountain West into the Rockies and Plains, generating heavy precipitation. An intense Pacific storm at mid-month spawned a rare thunderstorm outbreak, with lightning and wind gusts up to 80 mph, causing numerous power outages in western Washington. Nationally, November 1991 ranked as the 25th wettest on record, according to the standardized precipitation index (page 10), which takes local climatology into account. Storm tracks, however, veered away from California as well as the middle and southern Atlantic seaboard, leaving little precipitation and aggravating dryness across both regions. At month's end, a blinding dust storm, resulting from the dry and windy weather, caused a fiery pileup on Interstate 5 near Coalinga, CA in the San Joaquin Valley, taking 17 lives and injuring over 150 people.

Bitterly cold Arctic air more typical of January than the start of November, spread from the nation's midsection into the eastern U.S. early in the month. Temperatures averaged more than 20°F below normal in the northern and central Plains during the first week of November while dozens of locations observed readings below 0°F. Over 600 new daily minimum temperature records were set. The early-season cold wave was gradually replaced by milder air as stormy weather pushed into the Pacific Northwest, the southern and central Rockies, and the central Plains, dumping heavy precipitation on some locations. A storm off the Atlantic Coast produced beach erosion and coastal flooding but brought welcome rain to parts of the parched mid-Atlantic, with snow and freezing rain in higher Appalachians. Hawaii remained unusually mild and dry while Alaska's first significant cold wave of the season dropped readings to -49°F near Beaver and -41°F at Fort Yukon.

At mid-month, a powerful Pacific storm packing 80 mph wind left more than 400,000 homes and businesses in western Washington without power. This storm and subsequent systems brought heavy rain and snow to much of the Pacific Northwest and Rockies. Meanwhile, a slow moving cold front trekked from the Mississippi Valley to the Atlantic coast, spreading moderate to heavy rain across a broad area from eastern Texas and the central Gulf coast to southern New England, when 2 - 5 inches were measured. Southerly winds ahead of the system brought record late-season warmth to the eastern seaboard. During the latter part of the month, a winter storm blasted the north-central states, burying parts of Wisconsin under more than a foot of snow. Meanwhile, freezing rain glazed roads in Nebraska, causing more than 100 accidents. The storm system slowed to a crawl across the nation's midsection, dumping heavy rains across portions of the lower Mississippi and Tennessee Valleys. Thunderstorms spawned tornadoes in southern Missouri, causing several

deaths and extensive property damage. At month's end, much milder air enveloped Alaska while showers eased short-term dryness that had developed across Hawaii.

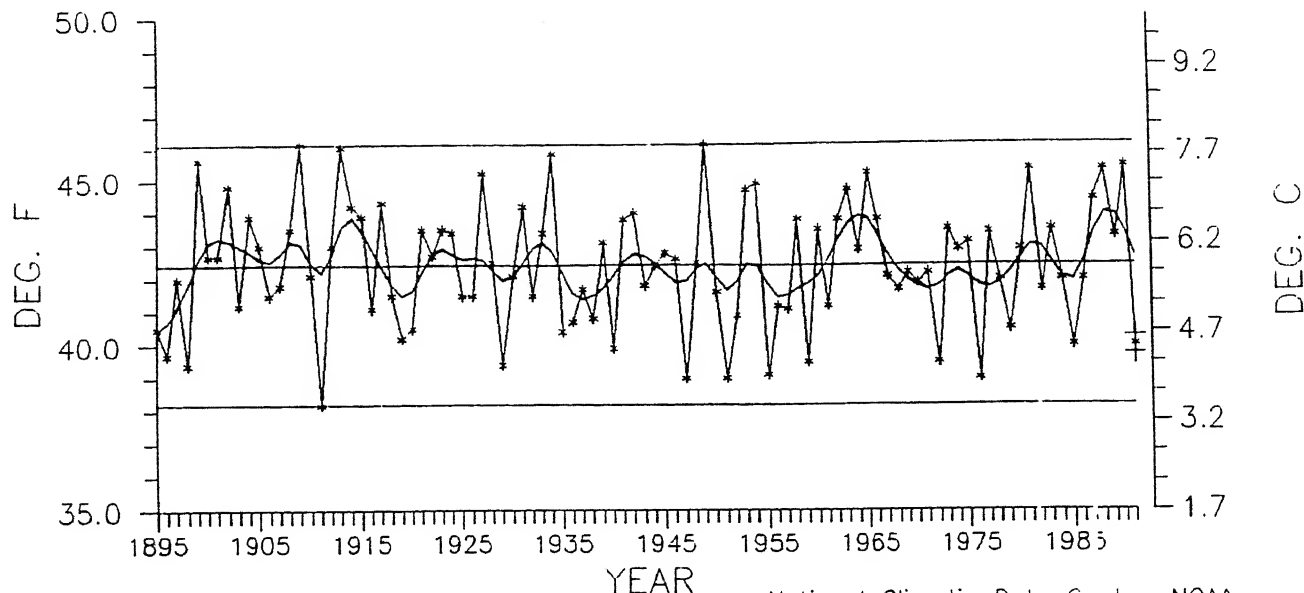
According to the River Forecast Centers, the greatest monthly precipitation totals (more than 6 inches) were measured along the Pacific Northwest coast, in the central Rockies, from northeastern Texas and eastern Oklahoma to the southern Appalachians, and across southern Alaska (Table 1). Above normal November precipitation prevailed over much of the country including the Northwest, the Intermountain West, the Rockies, the central Plains, the southern High Plains, the upper and middle Mississippi Valley, the Great Lakes, the Appalachians, southern Alaska, and portions of the Central Gulf coast and Northeast (Figure 2). According to the National Climatic Data Center, the East North Central and Southwest regions recorded the 2nd and 5th wettest November, respectively, in 1991 (page 11). During the first eleven months of the year, eleven states (AL, FL, GA, IA, LA, MI, MN, MS, NM, SD, and WI) experienced one of the ten wettest January - November periods since 1895. January - November 1991 ranked as the 22nd wettest such period nationally, according to the standardized precipitation index (page 17).

Abnormally dry conditions (less than 75% of normal precipitation) prevailed over California, central and southern Texas, the lower Mississippi Valley, the southern and middle Atlantic coast, northern Alaska, Hawaii, and portions of the northern Plains, Ohio Valley, and Northeast (Figure 2). Parts of California, Texas, Florida, the mid-Atlantic, Alaska, and Hawaii were extremely dry, receiving less than 25% of the normal precipitation (page 13). Regionally, the West had the 14th driest October on record in 1991 (page 11). During January - November, 1991, three states (MD, OH, and PA) had one of the ten driest such periods on record (page 17).

In the contiguous U.S., above normal November temperatures were limited to the Far West, Northeast, and parts of the mid-Atlantic and southern Florida (Figure 3). Departures of +2°F and above were restricted to portions of the Far West, Southwest, and New England, as well as southern Alaska and Hawaii (page 14). Regionally, only the West and Northeast ranked in the warmer half of the historical distribution (page 11). Despite a cool November, the year so far has been unusually warm, ranking as the 11th warmest January - November period since 1895 (page 11). Not surprisingly, nineteen states recorded one of the ten warmest such periods since 1895 (page 18).

Unseasonably cool weather dominated a large part of the country from the Intermountain West eastward to the lower Great Lakes, mid-Atlantic, and southern Atlantic coast as well as across northern and central Alaska (Figure 3). Well below normal temperatures prevailed across the north-central states and northern Alaska where monthly departures exceeded 6°F below normal (page 15). Temperature averaged across the contiguous U.S. was considerably below normal, ranking November 1991 as the 12th coldest on record (page 10). Regionally, the South (6th coldest), East North Central (8th), West North Central (12th), Central (17th), Southeast (25th), and Southwest (25th) experienced an abnormally cool November among the lower third of the historical distribution (page 11).

U.S. NATIONAL TEMPERATURE NOVEMBER, 1895-1991



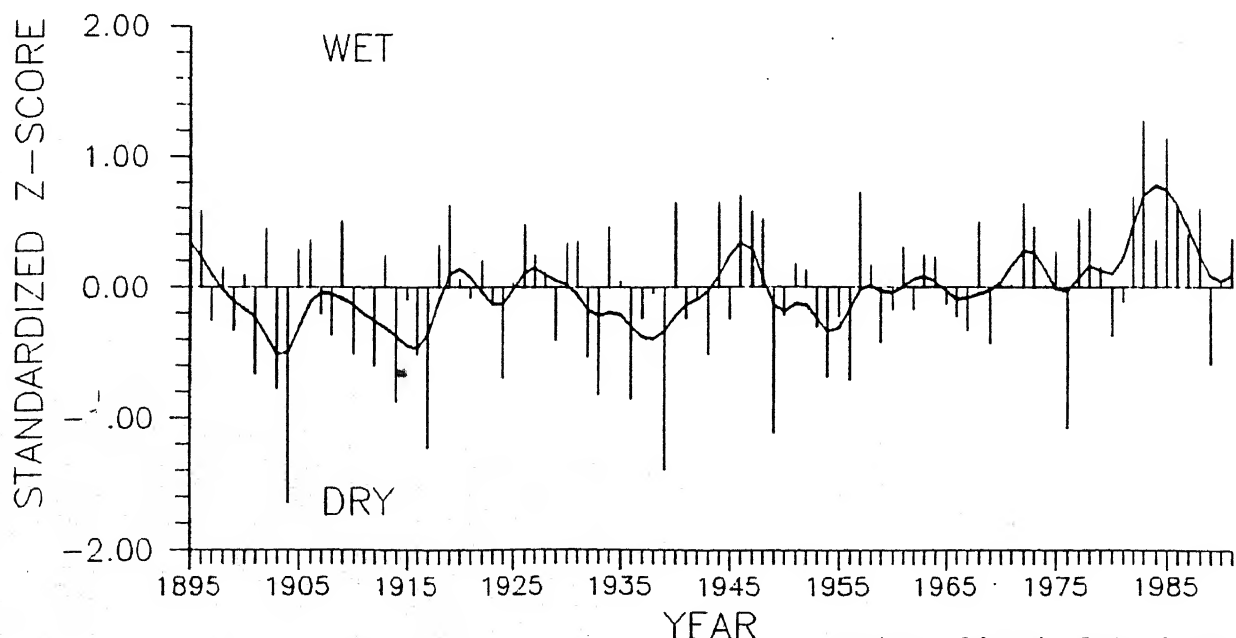
National Climatic Data Center, NOAA

STRAIGHT HORIZONTAL LINES ARE:
MAXIMUM VALUE (TOP),
LONG-TERM AVERAGE (MIDDLE),
MINIMUM VALUE (BOTTOM)

CONFIDENCE INTERVAL
FOR CURRENT YEAR'S
INDICATED BY '+'

Nationally Averaged November Temperatures 1895 - 1991, as Computed by the National Climatic Data Center. November 1991, averaged well below the long-term mean nationally (12th coldest). The 1991 value is based on preliminary data and should be within 0.26°F of the final data over a 31-month period. This was the first cooler than normal November since 1986.

U.S. NATIONAL WEIGHTED MEAN PRECIPITATION INDEX NOVEMBER, 1895-1991



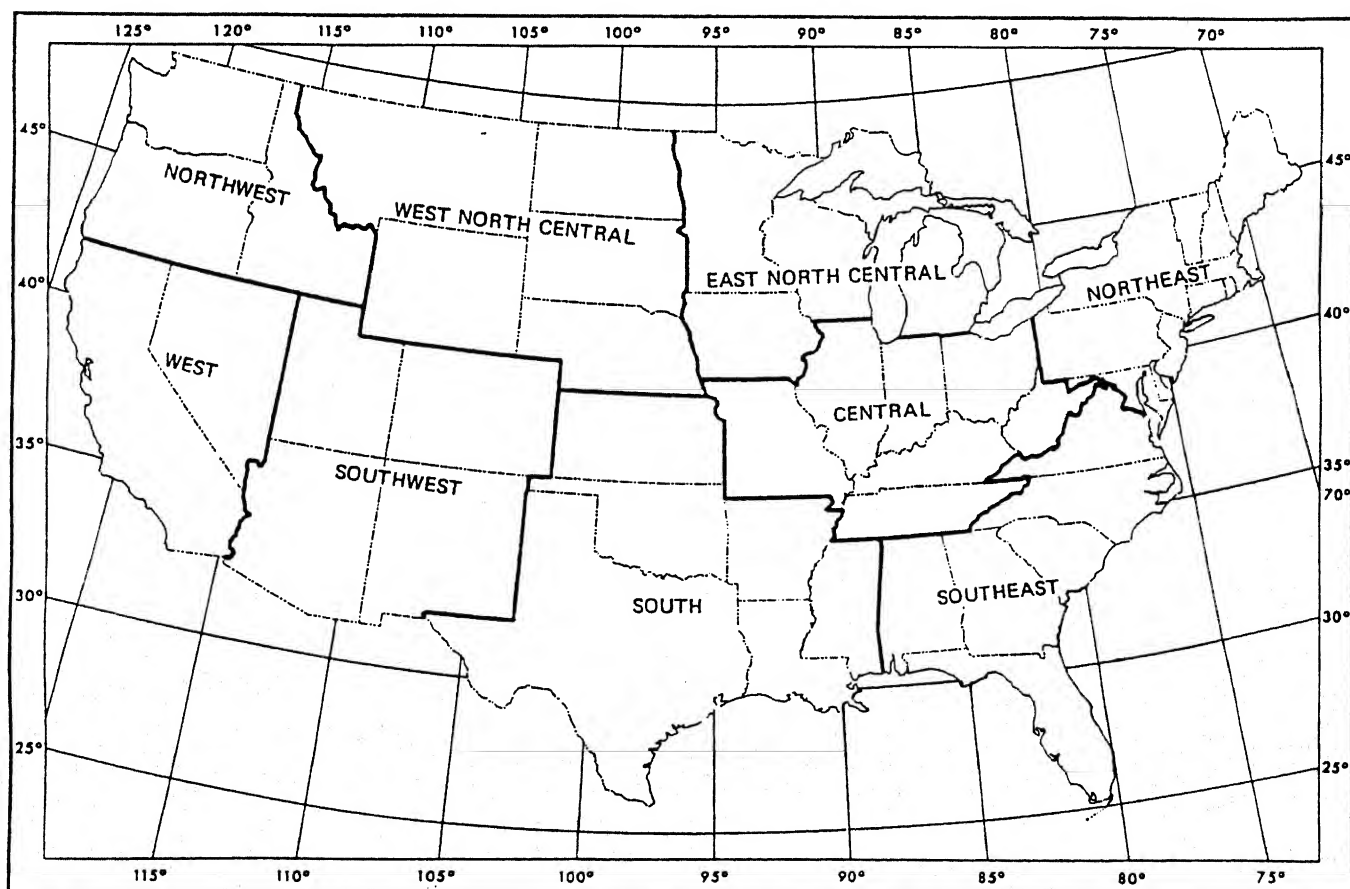
National Climatic Data Center, NOAA

National Mean November Precipitation Index, 1895-1991, as Computed by the National Climatic Data Center. November 1991 ranked as 25th wettest November during the last 97 years. This index takes local normals into account so that typically wet regions do not dominate the index value. Nine of the last ten Novembers have averaged wetter than normal.

**TEMPERATURE AND PRECIPITATION RANKINGS FOR
OCTOBER 1991, BASED ON THE PERIOD 1895 TO 1991.
1 = DRIEST/COLDEST AND 97 = WETTEST/HOTTEST.**

<u>REGION</u>	<u>PRECIPITATION</u>	<u>TEMPERATURE</u>
NORTHEAST	39	62
EAST NORTH CENTRAL	96	8
CENTRAL	60	17
SOUTHEAST	43	25
WEST NORTH CENTRAL	83	12
SOUTH	44	6
SOUTHWEST	92	25
NORTHWEST	66	42
WEST	14	63
NATIONAL	73	12

National Climatic Data Center



The Nine U.S. Regional Boundaries as Defined by the National Climatic Data Center (NCDC) and Regularly Used in the Monthly and Seasonal U.S. Climatic Summaries.

TABLE 1. SELECTED STATIONS WITH 150% OR MORE OF THE NORMAL PRECIPITATION AND 5.00 INCHES OR MORE PRECIPITATION; OR, STATIONS WITH 6.00 INCHES OR MORE PRECIPITATION AND NO NORMALS DURING NOVEMBER 1991.

<u>STATION</u>	<u>TOTAL</u> <u>(INCHES)</u>	<u>PCT. OF</u> <u>NORMAL</u>	<u>STATION</u>	<u>TOTAL</u> <u>(INCHES)</u>	<u>PCT. OF</u> <u>NORMAL</u>
ANNETTE ISLAND, AK	23.31	175.7	PARK FALLS, WI	5.95	313.2
KODIAK, AK	15.29	264.5	ROCHESTER, MN	5.90	406.9
EUGENE, OR	10.47	154.0	MARQUETTE, MI	5.87	201.0
JUNEAU, AK	9.07	176.8	MONTGOMERY, AL	5.85	197.6
EAU CLAIRE, WI	7.48	546.0	MOBILE, AL	5.78	157.9
CAPE GIRARDEAU, MO	7.38	200.0	HARRISON, AR	5.77	192.3
MUSCLE SHOALS, AL	7.25	193.3	WAUSAU, WI	5.37	301.7
TACOMA/MCCHORD AFB, WA	6.46	***	MINNEAPOLIS, MN	5.29	416.5
GRAND RAPIDS, MI	6.41	224.9	JACKSON, KY	5.22	164.2
LA CROSSE, WI	6.25	416.7	MOLINE, IL	5.03	259.3
TACOMA/FT LEWIS/GRAY AAF, WA	6.09	***	CHARLESTON, WV	5.00	173.0

NOTE: Stations without precipitation normals are indicated by asterisks.

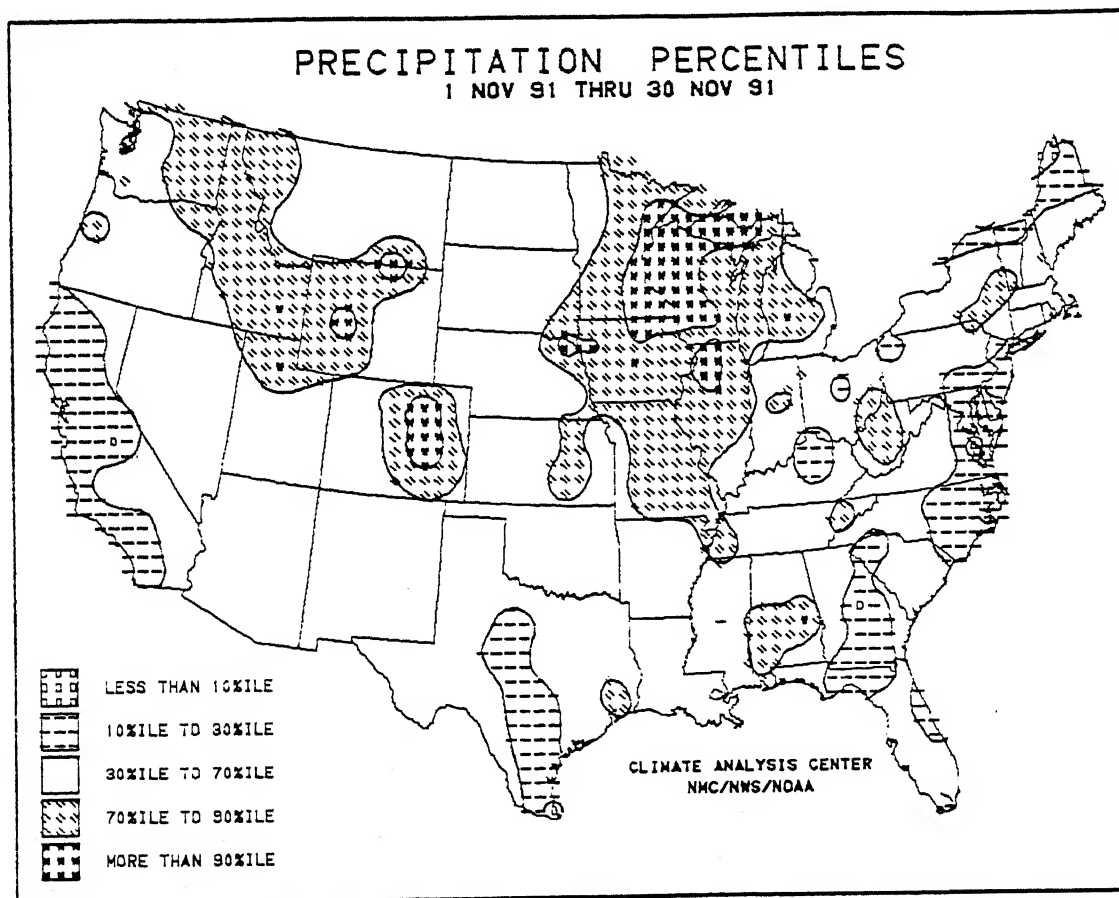


FIGURE 1. November 1991 Precipitation Percentiles. Significant November dryness [$<30\%$ ile] was observed in California, central and southern Texas, the southern and middle Atlantic Coast states, and portions of the Ohio Valley. In contrast, abnormally wet weather [$>70\%$ ile] affected the northern Intermountain West, northern and Northeast. Exceptionally wet conditions [$>90\%$ ile] prevailed in parts of the central and northern Rockies, upper Mississippi Valley, and upper Great Lakes, where Minneapolis, MN established a new all-time monthly snowfall record.

TABLE 2. SELECTED STATIONS WITH 50% OR LESS OF THE NORMAL PRECIPITATION AND NORMAL PRECIPITATION OF 3.00 INCHES OR MORE DURING NOVEMBER 1991.

STATION	TOTAL (INCHES)	PCT. OF NORMAL	NORMAL (INCHES)	STATION	TOTAL (INCHES)	PCT. OF NORMAL	NORMAL (INCHES)
KEY WEST, FL	0.13	4.0	3.27	GREENVILLE, SC	1.39	44.6	3.12
DOVER AFB, DE	0.24	7.2	3.32	ISLIP, NY	1.39	31.7	4.38
SALISBURY, MD	0.61	19.9	3.06	HONOLULU, OAHU, HI	1.54	48.1	3.20
MILLVILLE, NJ	0.62	17.3	3.59	PHILADELPHIA, PA	1.55	47.0	3.30
TALLAHASSEE, FL	0.63	19.1	3.29	COLD BAY, AK	1.57	37.8	4.15
RED BLUFF, CA	0.66	21.4	3.08	ATHENS, GA	1.58	47.9	3.30
RICHMOND/BYRD, VA	0.67	20.4	3.28	JONESBORO, AR	1.60	42.7	3.75
ATLANTIC CITY, NJ	0.76	20.5	3.71	NEW YORK/LA GUARDIA, NY	1.72	45.9	3.75
ANDERSON, SC	0.95	30.7	3.09	NEW YORK/KENNEDY, NY	1.79	48.0	3.73
CAPE HATTERAS, NC	1.15	23.9	4.82	EUREKA, CA	2.04	34.7	5.88
LAFAYETTE, LA	1.22	33.9	3.60	GREENWOOD, MS	2.12	46.6	4.55
WILMINGTON, DE	1.24	37.2	3.33	SEXTON SUMMIT, OR	2.66	44.6	5.96
LEXINGTON, KY	1.27	38.5	3.30	ADAK, AK	3.50	47.1	7.43
COLLEGE STATION, TX	1.27	38.1	3.33	BLUE CANYON, CA	3.55	42.2	8.41
REDDING, CA	1.27	22.8	5.56	HILO/LYMAN, HAWAII, HI	6.73	45.3	14.86

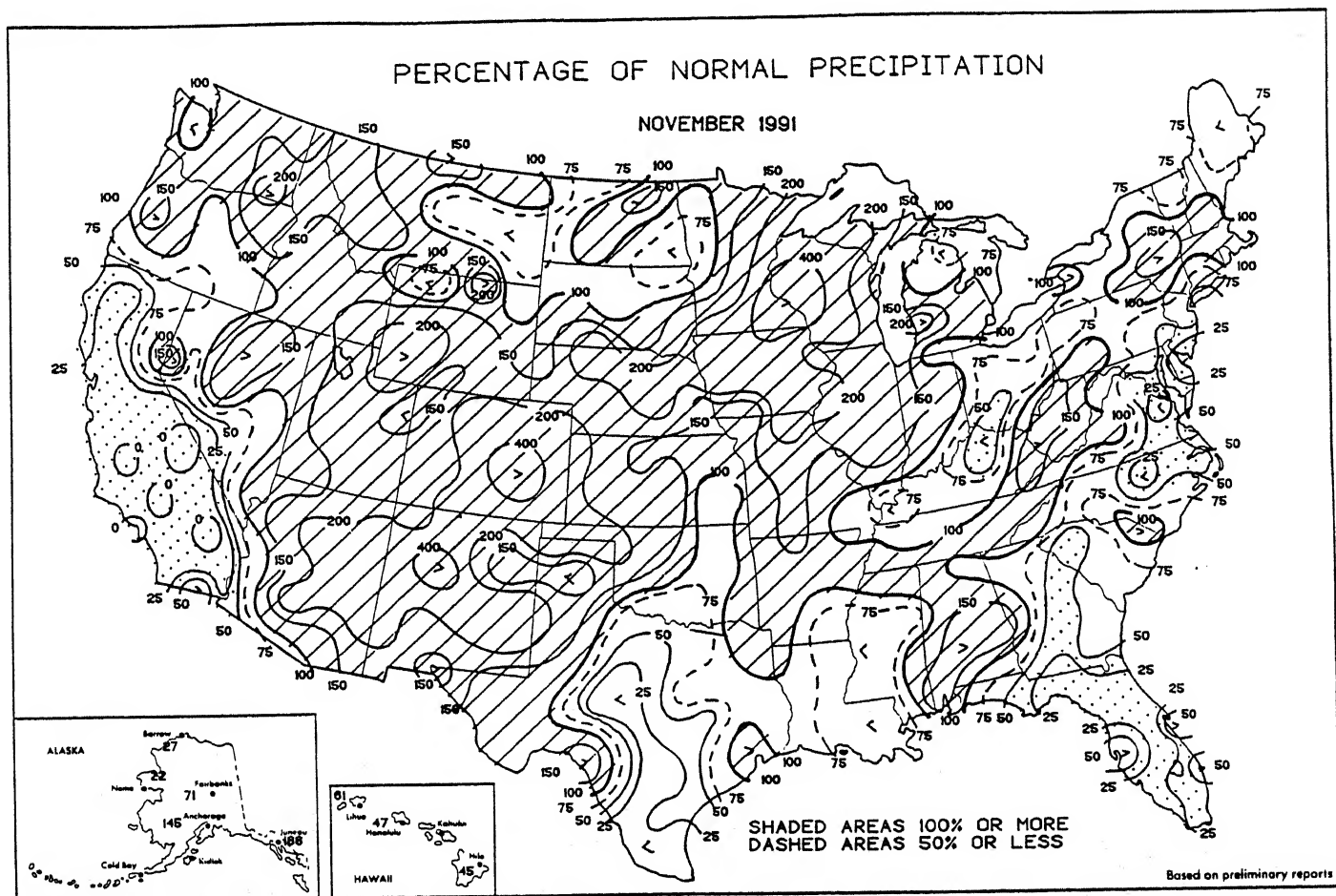


FIGURE 2. November 1991 Percent of Normal Precipitation. Isopleths drawn for 0, 25, 50, 75, 100, 150, 200, and 400 percent. Precipitation was abnormally heavy across much of the Intermountain West, Rockies, central Plains, southern High Plains, upper and middle Mississippi Valley, Great Lakes, and parts of the central Gulf coast and Appalachians. Dry conditions, however, prevailed along much of the southern and middle Atlantic coast, southern and central Texas, California, Hawaii, and northern Alaska, where less than half of normal precipitation was observed. This marks the sixth consecutive wet season to start slowly across California.

TABLE 3. NOVEMBER 1991 AVERAGE TEMPERATURE 3.0°F OR MORE ABOVE NORMAL.

STATION	DEPARTURE (°F)	AVERAGE (°F)	STATION	DEPARTURE (°F)	AVERAGE (°F)
SITKA, AK	+6.4	43.6	BLUE CANYON, CA	+3.4	47.6
VICTORVILLE/GEORGE AFB, CA	+5.9	55.1	BURBANK/HOLLYWOOD, CA	+3.3	63.2
KENAI, AK	+4.4	26.3	MT WASHINGTON, NH	+3.3	23.8
CORDOVA/MILE 13, AK	+4.3	34.9	MEDFORD, OR	+3.2	46.8
TALKEETNA, AK	+4.3	22.2	SAN FRANCISCO, CA	+3.1	57.6
ANNETTE ISLAND, AK	+4.1	43.9	STOCKTON, CA	+3.1	56.1
YAKUTAT, AK	+4.0	36.5	MT SHASTA, CA	+3.1	43.9
VALDEZ, AK	+3.9	30.1	HOMER, AK	+3.1	32.3
MOLOKAI, MOLOKAI, HI	+3.7	78.2	SAN JOSE/MUNI, CA	+3.0	58.2
RENO, NV	+3.6	43.3	REDMOND, OR	+3.0	41.1

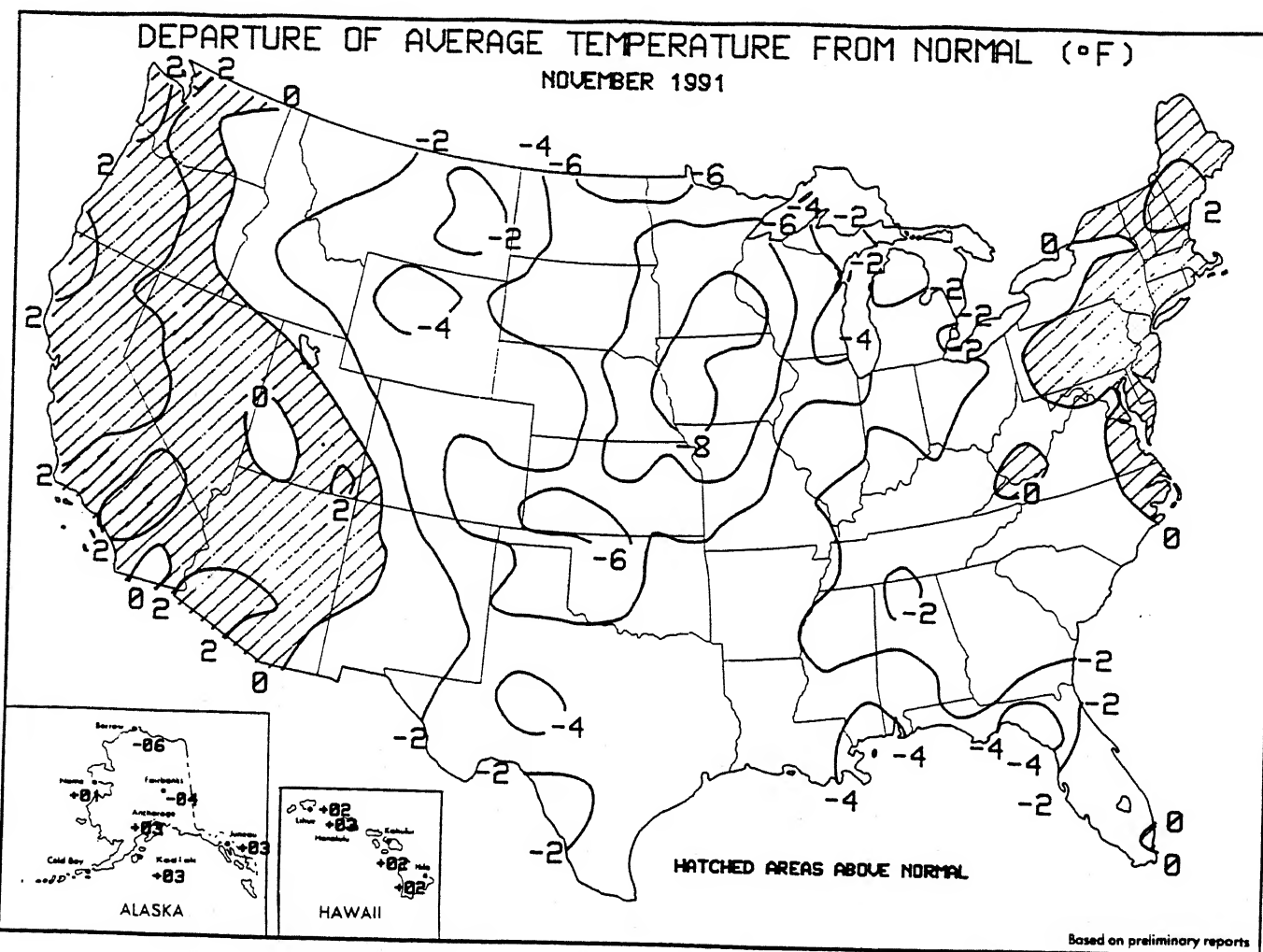


FIGURE 3. November 1991 Departure of Average Temperature from Normal (°F). Isotherms drawn only for -8°F, -6°F, -4°F, -2°F, 0°F, and 2°F. Cooler than normal conditions encompassed a majority of the nation from the Rockies eastward to the Appalachians and southern Atlantic coast. Monthly departures below -8°F were observed in parts of the western Corn Belt and upper Mississippi Valley. Few areas experienced abnormally mild weather, with departures exceeding +2°F limited to the Far West, northern New England, southern Alaska, and Hawaii.

TABLE 4. NOVEMBER 1991 AVERAGE TEMPERATURE 6.0°F OR MORE BELOW NORMAL.

<u>STATION</u>	<u>DEPARTURE</u> (°F)	<u>AVERAGE</u> (°F)	<u>STATION</u>	<u>DEPARTURE</u> (°F)	<u>AVERAGE</u> (°F)
ROCHESTER, MN	-9.0	24.1	OTTUMWA, IA	-7.2	32.3
SPENCER, IA	-8.9	24.6	LINCOLN, NE	-6.8	31.6
OMAHA/EPPLEY, NE	-8.9	30.6	CONCORDIA, KS	-6.8	34.5
NORTH OMAHA, NE	-8.8	30.6	DULUTH, MN	-6.7	21.9
MINNEAPOLIS, MN	-8.6	24.4	WATERTOWN, SD	-6.7	23.2
LA CROSSE, WI	-8.3	27.3	WATERLOO, IA	-6.7	28.8
SIOUX CITY, IA	-8.1	28.2	WORLAND, WY	-6.6	24.2
MASON CITY, IA	-8.0	26.0	DEVIL'S LAKE, ND	-6.5	19.9
ST CLOUD, MN	-7.9	22.4	FARGO, ND	-6.5	21.9
EAU CLAIRE, WI	-7.8	24.2	ALEXANDRIA, MN	-6.3	22.8
KANSAS CITY/INTL, MO	-7.7	36.7	TUCUMCARI, NM	-6.3	40.3
DES MOINES, IA	-7.6	30.9	GARDEN CITY, KS	-6.2	35.0
BETTLES, AK	-7.4	-6.3	DODGE CITY, KS	-6.2	36.3
WARROAD, MN	-7.4	18.2	ALAMOSA, CO	-6.1	23.6
ENID/VANCE AFB, OK	-7.4	41.5	PARK FALLS, WI	-6.1	23.9
CEDAR RAPIDS, IA	-7.3	30.8	PUEBLO, CO	-6.1	34.0
SIOUX FALLS, SD	-7.2	25.7	SALINA, KS	-6.1	36.7
NORFOLK, NE	-7.2	28.8			

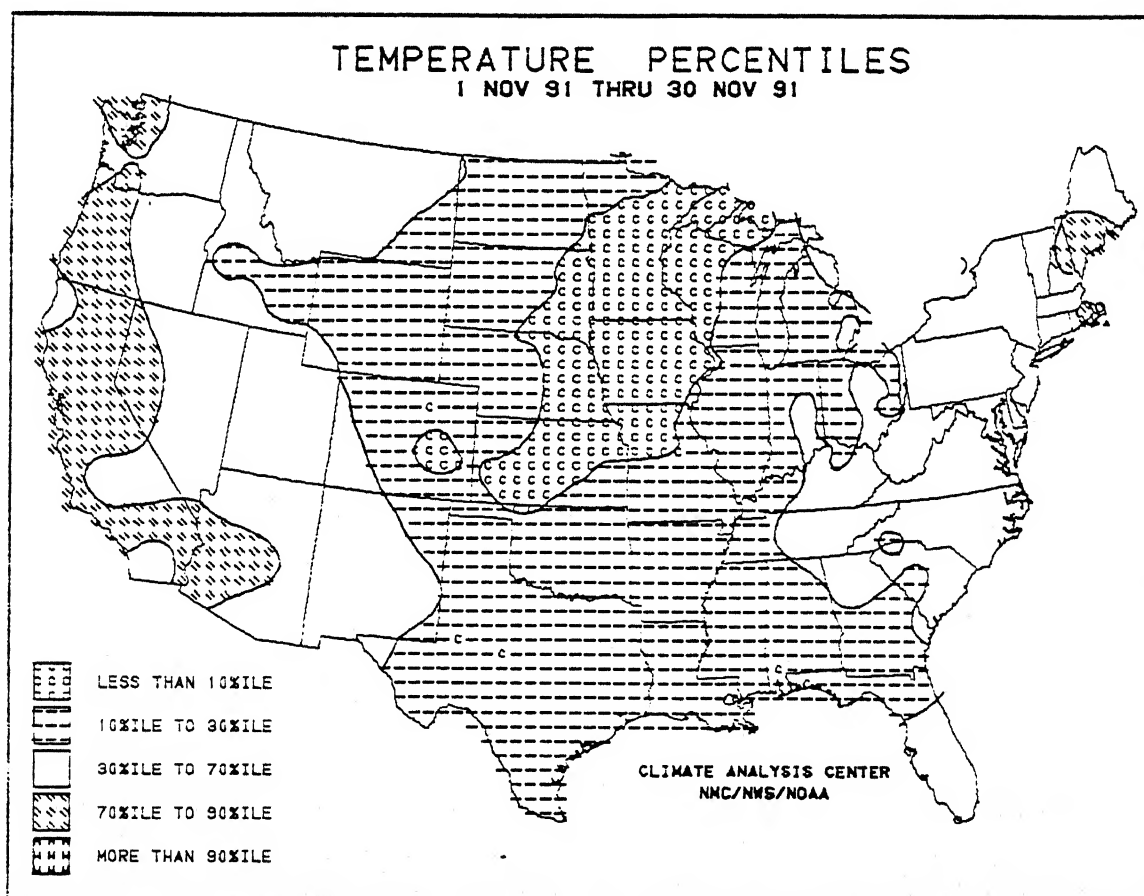


FIGURE 4. November 1991 Temperature Percentiles. *Significant November warmth [$>70\%$ ile] was restricted to the Far West and portions of New England, while unusually low temperatures [$<30\%$ ile] gripped much of the nation from the central Rockies and Great Plains to the Great Lakes, Ohio Valley, and Southeast. A swath from the central Great Plains to the upper Great Lakes recorded much cooler than normal conditions that ranked in the cooler 10 percent of the historical distribution.*

TABLE 5. RECORD NOVEMBER PRECIPITATION

<u>STATION</u>	<u>TOTAL</u> (INCHES)	<u>NORMAL</u> (INCHES)	<u>PCT. OF</u> <u>NORMAL</u>	<u>RECORD</u> <u>TYPE</u>	<u>RECORDS</u> <u>BEGAN</u>
La Crosse, WI	6.25	1.50	416.7	HIGHEST	1952
Rochester, MN	5.90	1.45	406.9	HIGHEST	1961
Minneapolis, MN	5.29	1.27	416.5	HIGHEST	1938
Sheridan, WY	2.40	0.81	296.3	HIGHEST	1908
Albuquerque, NM	1.93	0.36	536.1	HIGHEST	1931
Cape Hatteras, NC	1.15	4.82	23.9	LOWEST	1958
Key West, FL	0.13	3.27	4.0	LOWEST	1945
Kahului, Maui, HI	0.05	2.11	2.4	LOWEST	1947
Los Angeles, CA	0.00	1.52	0.0	LOWEST	1936
Daggett, CA	0.00	0.28	0.0	LOWEST	1951

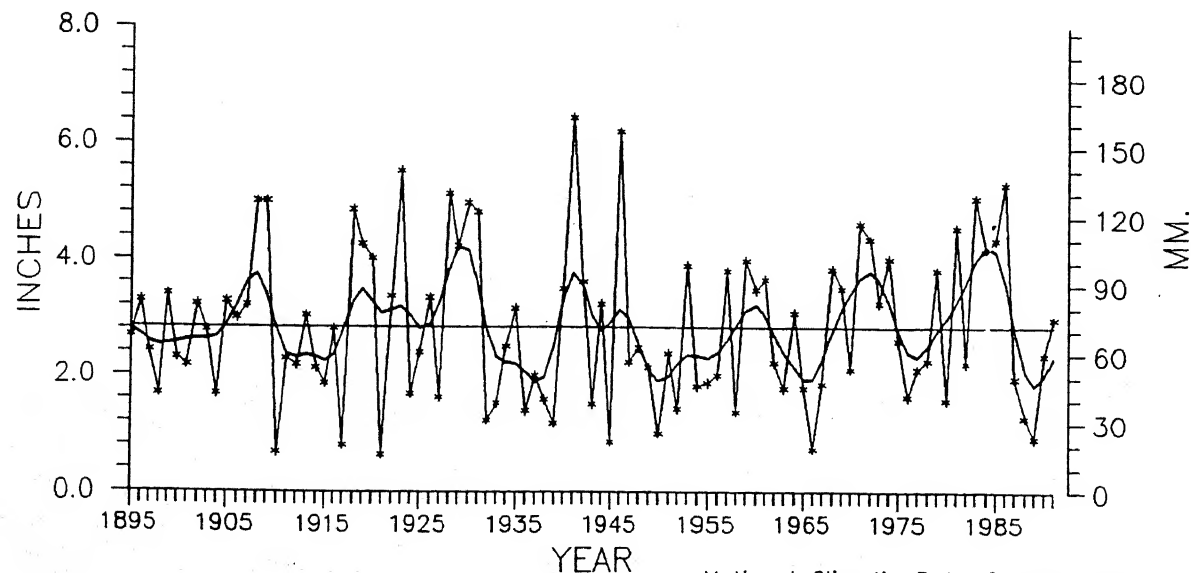
NOTE: Trace precipitation is considered ZERO precipitation. Stations with no precipitation are only included if normal precipitation is 0.25 inches or more.

TABLE 6. RECORD NOVEMBER SNOWFALL

<u>STATION</u>	<u>TOTAL</u> (INCHES)	<u>STATION</u>	<u>TOTAL</u> (INCHES)
Duluth, MN	50.1	Colorado Springs, CO	21.7
Marquette, MI	48.9	Waterloo, IA	15.4
Minneapolis, MN	46.9 (ALL-TIME)	Des Moines, IA	14.0
La Crosse, WI	30.3		

TABLE 7. RECORD NOVEMBER EXTREME TEMPERATURES.

<u>STATION</u>	<u>EXTREME</u> (°F)	<u>DATE</u>	<u>RECORD</u> <u>TYPE</u>	<u>RECORDS</u> <u>BEGAN</u>
Medford, OR	75	NOV 6	HIGHEST	1930
Corpus Christi, TX	29	NOV 24	LOWEST	1939
Oklahoma City, OK	11	NOV 3	LOWEST	1940
Kansas City/Intl, MO	1	NOV 8	LOWEST	1972
Columbia, MO	0	NOV 8	LOWEST	1969
Des Moines, IA	-4	NOV 8	LOWEST	1939
Sioux City, IA	-9	NOV 7	LOWEST	1940

**PRIMARY HARD RED WINTER WHEAT BELT PRECIPITATION
OCTOBER–NOVEMBER, 1895–1991**

National Climatic Data Center, NOAA

Weather prevailed over the primary hard red winter wheat belt during November, bringing precipitation totals to above normal for the 1991 growing season to date (October and November). This marks the first time in five years that November brought above normal precipitation to the region.

PRECIPITATION RANKINGS FOR JAN-OCT 1991, BASED ON THE PERIOD 1895 TO 1991. 1 = DRIEST, 97 = WETTEST.

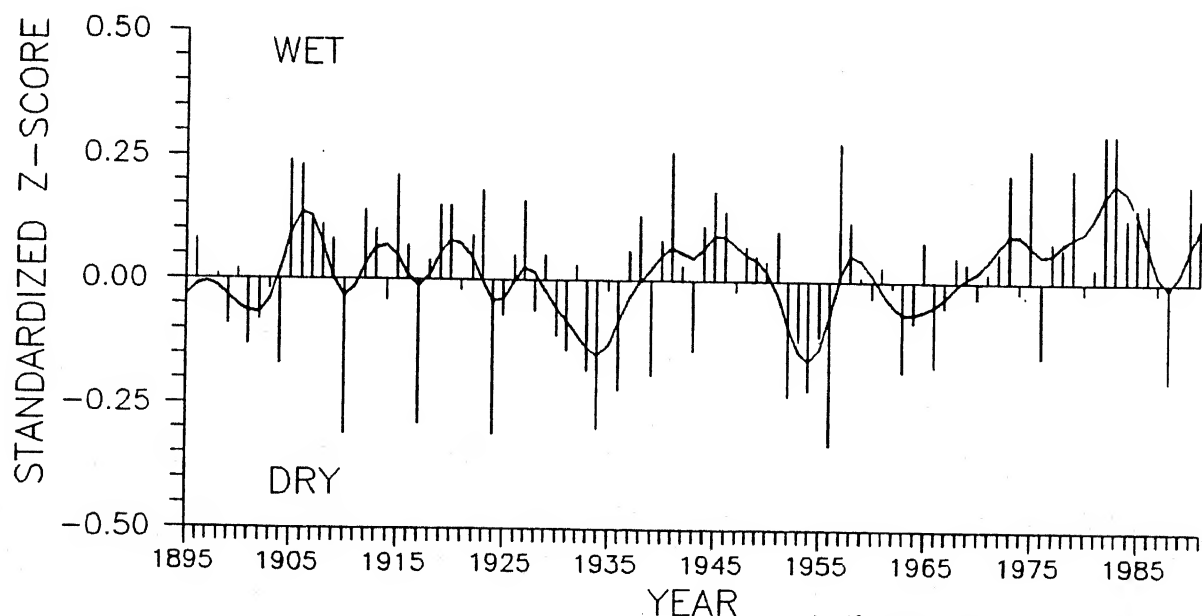
<i>STATE</i>	<i>RANK</i>	<i>STATE</i>	<i>RANK</i>	<i>STATE</i>	<i>RANK</i>	<i>STATE</i>	<i>RANK</i>
AL	88	IA	88	NE	51	RI	80
AZ	41	KS	19	NV	50	SC	79
AR	79	KY	25	NH	58	SD	87
CA	36	LA	97	NJ	34	TN	71
CO	65	ME	56	NM	88	TX	84
CT	70	MD	5	NY	27	UT	68
DE	33	MA	82	NC	37	VT	51
FL	95	MI	88	ND	73	VA	16
GA	90	MN	96	OH	7	WA	58
ID	37	MS	96	OK	60	WV	13
IL	55	MO	32	OR	27	WI	96
IN	32	MT	78	PA	6	WY	66

National Climatic Data Center

Top 10 rankings : **BOLD**

Bottom 10 rankings : *Italics*

**U.S. NATIONAL WEIGHTED MEAN PRECIPITATION INDEX
JANUARY–NOVEMBER, 1895–1991**



National Climatic Data Center, NOAA

January – November Mean Precipitation Index, 1895–1991, as Computed by the National Climatic Data Center. *Above median precipitation was measured nationally during January through November 1991 (22nd wettest such period) for the seventh time in 10 years. This index takes local normals into account so that typically wet areas do not dominate the index value.*

TEMPERATURE RANKINGS FOR JAN-OCT 1991, BASED ON THE PERIOD 1895 TO 1991. 1 = COLDEST AND 97 = WARMEST.

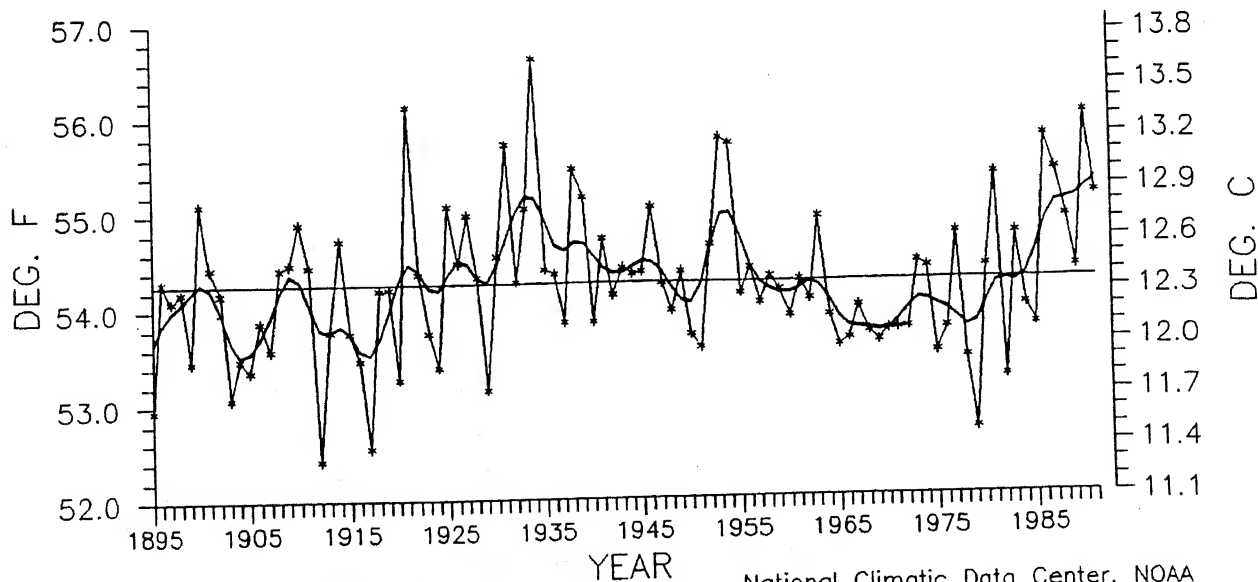
<u>STATE</u>	<u>RANK</u>	<u>STATE</u>	<u>RANK</u>	<u>STATE</u>	<u>RANK</u>	<u>STATE</u>	<u>RANK</u>
AL	60	IA	72	NE	79	RI	96
AZ	71	KS	82	NV	72	SC	79
AR	61	KY	94	NH	94	SD	82
CA	73	LA	62	NJ	96	TN	72
CO	51	ME	71	NM	26	TX	39
CT	96	MD	96	NY	94	UT	47
DE	95	MA	95	NC	92	VT	94
FL	92	MI	89	ND	88	VA	94
GA	73	MN	81	OH	96	WA	68
ID	65	MS	59	OK	70	WV	95
IL	81	MO	80	OR	77	WI	79
IN	91	MT	84	PA	96	WY	80

National Climatic Data Center

Top 10 rankings : **BOLD**

Bottom 10 rankings : *Italics*

**U.S. NATIONAL TEMPERATURE
JANUARY–NOVEMBER, 1895–1991**



January – November Nationally Averaged Temperatures, 1895–1991, as Computed by the National Climatic Data Center. *Despite a cold November, the year so far has been unusually warm, ranking as the 11th warmest January – November Period on record. The first eleven months of the year have averaged near to much above normal for the last six years.*

